Participants:

Jonathan Hammer (CAASD)
Steve Koczo (Rockwell-Collins)
Ganghuai Wang (CAASD)
Bill Lee (Boeing)
Michael Petri (FAA WJH Technical Center)
Andy Zeitlin (CAASD)
Dave Spencer (MIT LL)
Lee Etnyre (UPS AT)

Papers:

File Name	Author	Description
Activity Diagram Notation.doc	Michael Ulrey	Provides notation of activity diagrams
EVA Diagrams in Word (from PS).doc	Michael Ulrey	Example of EVA application chart in UML
IMC Approach Spacing phases -- Lee.ppt	Bill Lee	IMC approach spacing phases diagram
Approach-Spacing.jpg	Ganghaui Wang	Object Process Methodology figure for approach spacing
IMC approach spacing safety table 8-01 -- Hammer.xls	Jonathan Hammer	Revised safety table for approach spacing

Agenda item 1: State Diagrams

Jonathan stated that the objective of the telecon is to bring closure to an initial methodology for drawing state charts. Two different approaches were considered, the OPM methodology as represented in Ganghuai's figure and the UML methodology as represented in Michael Ulrey's figures.

Ganghuai Wang presented a figure depicting the approach spacing application procedure in an Object Process Methodology (see Approach-Spacing.jpg). Comments: Bill Lee -- the figure needs to break out the non-normal cases, for example, "ATC providing approach spacing service" should be inside a separate process. Andy Zeitlin -- more detail will probably be needed in some areas like adjusting speed for spacing to clarify the role of the equipment and how we derive requirements for it.

Ganghuai -- could do a decomposition of each phase/process for more detail.

Bill Lee expressed the opinion that we need to be careful if we break the figure down into too many hierarchical levels as the drawing will be hard to follow and people will want to piece it back together with tape.

Dave Spencer -- felt that the OPM figure was not too much different from a transition diagram? Dave wondered if we need the Boolean objects -- could they be replaced by an annotated arc and help to de-clutter the figure. More discussion on this took place later, when it was agreed that we would replace the condition boxes with a diamond and annotated arcs.

Safety tables -- Jonathan presented IMC approach spacing safety table 8-01 -- Hammer.xls. The table was re-organized to line up with the phases and processes in the OPM figure that Ganghuai had presented. There was general agreement that the form of the table was an improvement and enables better traceability. We also explained the change in terminology from hazard to operational consequence.

We then went over Mike Ulrey's diagram (files -- Activity Diagram Notation.doc and EVA Diagrams in Word (from PS).doc). Steve & Jonathan thought that the ideas were similar to those in the OPM, with different symbology. Steve felt that there were many subtle distinctions in the states for UML that for our purposes could be collapsed into just "states." All the transitions can probably be collapsed into one transition. Steve felt that the figures need to comes down to states, transitions, and conditions. Bill Lee -- there are subtle differences in the state types that are needed for a very detailed analysis of hardware/software. Making those distinction for our needs is probably overkill.

Jonathan suggested that we can make our own notation if we are not dependent on using the tools, if all we need to do is to draw the figures. Lee Etnyre noted that the notation for UML is not tool specific. If you use the UML symbology , however, not everyone will be familiar and you will need to educate them. Bill Lee -- best if we try to keep things intuitive.

Steve K. expressed concern that the hazards combinations could become exponential -- will we need a tool to really fully analyze the applications? Group -- we think we can probably avoid getting into the fine grained detail that would require an automated simulation. *The group agreed that for now, we will not depend on any automated tool to draw the state charts, and we will assume that our diagrams will be sufficiently simple that an automated analysis is not required*. If we find out later that this is not the case for some applications, we retain the option to do more automated anlysis.

We agreed that our process for now will be to (1) to identify the operational phases (2) depict the phases in a process diagram using Ganghaui's diagram as a model (3) replace the conditional boxes with a diamond as per UML, and use annotated arcs to show the conditions (self-transitions i.e., transitions back to the same process, do not need to be shown). We agreed that for reference purposes, we would number each box and transition, E.g., P1, P1.1, P2 for processes, P1.1-P2.1 for transitions.

We will also annotate processes with the relevant equipment that enables the process to take place, e.g., CDTI. Furthermore, we agreed that there should be only one path to transition to a new process, and that we need to show the transition of separation

responsibility, e.g., "ATC ensuring separation" in Ganghuai's top process needs to be followed through in subsequent processes.

Ganghaui agreed to take the action to write a key to the symbology we will use.

Agenda item 2: Meeting schedule

Next teleconference will be 9/19 joint with Eurocae WG51 SG3.

Next meeting will be moved from December 4-6 tentatively to December 10, 11, and 1/2 day December 14. The plenary will be on December 12, 13.